PART I - SECTION C
SCOPE OF WORK

Design and construction of the test vehicle system requires experience in the design, construction, and integration of civil engineering structures, mechanical engineering structures, dynamic analysis, electrical and hydraulic power systems, automatic control systems, and instrumentation systems.

The test vehicle shall satisfy the following General Functional Specifications:

1. Pavement loading will be full-scale and representative of new generation heavy civil transport aircraft.
2. The test vehicle will be used to evaluate pavement response and performance to aircraft wheel loads ranging from 10,000-lbs (45 kN) to 100,000-lbs (445 kN) and pavement temperatures up to 150 deg.F. The test wheel load control (dynamic) shall be ±2%, or better, of the design load.
3. The mechanism for loading the tires must be automatic and maintain constant vertical load while the tires are in contact with the test pavement. Tire loads must be adjustable over the full design range.
4. Test speeds will range from 0.17 mph (0.27 kmph) to 5 mph (8 kmph). The test wheel speed control shall be ±1%, or better, of the command speed.
5. The vehicle must be capable of applying bi-directional and unidirectional loading.
6. The test vehicle must accommodate a lateral wander pattern up to a maximum wander width of ± 3 feet. Control of lateral wander position shall be better than ±0.2 inches (± 5mm).
7. The test vehicle must be capable of applying wheel loads in both a single and dual wheel configuration. The change from a single wheel configuration to a dual wheel configuration and vice versa shall be a two-person operation requiring not more than one day to accomplish. To ensure compatibility with the NAPTF vehicle, the single wheel tire to be used will be radial aircraft tires size 52x21.0R22 mounted to steel rims built to government furnished drawings and specifications. The axle should be capable of accepting this wheel and the dual wheel assembly. The dual wheel assembly should be designed to accommodate tires of smaller sizes (such as Boeing 737-800) mounted to steel rims built to government furnished drawings and specifications. The tires furnished with the vehicle shall be radials.
8. The vehicle must have the capability to remotely monitor the inflation pressure in test wheel(s).
9. The test vehicle shall be designed for unmanned continuous, automatic operation, with minimum downtime.
10. The mechanism for loading the tires must allow for a minimum of 15 inches (38 cm) total vertical travel, relative to the pavement, in the direction of loading.
11. The wheel load over the full test section length (40-feet) shall not vary by more than an additional ±2% after passing over a 1 inch (25 mm) bump or drop, at the specified test speed.

12. The test vehicle shall have a central controller that can be programmed to provide automatic test sequencing and interfacing with the pavement instrumentation and data acquisition system.
13. The controller shall be capable of positioning the test wheel(s) at a specified location with the test tires clear of pavement, position the wheel for zero lateral wander, load the test wheel to the desired test load, accelerate the wheel to the test speed, and then maintain constant test speed and test wheel loads.
14. The vehicle data collection system shall be capable of continuous recording of vehicle parameters such as position of test wheel (lateral and longitudinal), tire pressure, tire load, tire temperature, air temperature, and number of passes.
15. The test vehicle shall be capable of testing in both automatic and manual modes.
16. The test vehicle shall be capable of automatically shutting itself down after the preprogrammed number of passes. It should also be capable of shutting itself down if a malfunction is detected.
17. All required computer hardware, software, and related materials to permit both manual and automated control of the test vehicle shall be provided by the supplier.
18. The vehicle shall be self-sufficient for power as well as have the ability to be operated from an external electric supply.
19. The vehicle shall have the ability to heat the pavement and maintain the temperatures (at least up to 150 °F pavement surface temperature) to simulate thermal gradients observed in airport pavements.
20. A list of recommended spare parts and sources from which standard parts can be obtained shall be provided.
21. The supplier shall provide a servicing and maintenance schedule, along with a list of lubricants, fuels, and sources.
22. A complete set of electronic schematic drawings and a complete set of as-built drawings with accompanying parts identification and sources shall be provided, along with manuals describing all operational and servicing requirements.
23. The supplier shall provide training at FAA (William J. Hughes Technical Center) on the set-up, operation, maintenance, and servicing for the proper use of the test vehicle including manual and complete automatic operations. Proper start-up procedures after an emergency shutdown shall also be demonstrated upon delivery.
24. The supplier shall propose a test plan for test vehicle shake-down tests for FAA approval. Upon approval, the supplier shall execute the test plan. The acceptance will depend on the test vehicle meeting or exceeding FAA specifications.
25. Supplier shall provide a minimum of one year warranty with an option of purchasing warranty for additional years.
26. The components used for the test vehicle shall be new and shall meet all applicable Federal, State, and Local standards for operational safety, environmental use, noise, etc.
27. The test vehicle shall meet industry standards for design, construction, and operation.